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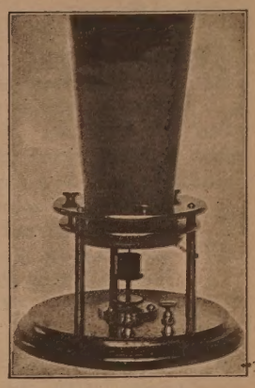
THE NEWSPAPER FOR
THE HOBBYIST OF VINTAGE
ELECTRONICS AND SOUND

THE HORN SPEAKER

TELEPHONE CENTENNIAL
1876 - 1976



CROSLEY RECEIVERS

A description of three different models of midget receivers featuring unusual cabinet designs.

WHEN the automobile industry had perfected the mechanical features of its cars to a high degree, it turned its attention towards beautifying and modernizing the car bodies. The radio industry has followed in the footsteps of the automobile industry. The avalanche of new tubes that has made its appearance during the past year has stimulated the engineering departments of set manufacturers to a point where they now produce very sensitive and selective receivers heretofore impossible with the same number of tubes. Now that the electrical and mechanical features have been somewhat stabilized, attention has been turned toward unique cabinet design.

Crosley has been the pioneer in this respect, as exemplified by their Book Case Model receiver illustrated in Fig. A. It takes but a glance at the upper part of this photograph to realize that even an expert can be fooled by its appearance. To all intents and purposes, it appears as a beautiful set of books; but, on closer examination, and by an inspection of the lower part of the figure, it is seen to be a little radio set, camouflaged so as to present a unique and dignified appearance.

The schematic of this receiver is illustrated in Fig. 1, and it is seen to be a five-tube superheterodyne—five tubes including the rectifier—of rather unusual design. It is operated from the conventional 110-volt, 60-cycle line, and employs the following tubes: a 24 as an oscillator—first detector, V1; a 58 as an I.F. amplifier, V2; a 57 second detector, V3; and 47 output tube. The 80 rectifier is seen at the extreme right of the diagram. Using this tube arrangement, it is possible to secure the high gain which is characteristic of superheterodynes, and, at the same time, obtain excellent selectivity by means of the efficient tuning circuits.

Coil L1 is the antenna coil, which is connected in series with another small coil acting as a cathode coupler to the oscillator portion of the tube. The set of coils L2 are the conventional oscillator inductances common to some types of dynatron oscillators. A feature of particular note is its inclusion of an R.F. choke in series with the control-grid lead of the 58 tube. This choke prevents parasitic oscillations from taking place, and also assists in blocking out any high-frequency oscillations from V1. The 57 second detector is resistance-coupled into the 47 output tube, which, in turn, has its conventional output transformer connected to the speaker.

The following filament voltages exist: all tubes but the rectifier, 2.2 to 2.6 volts; rectifier, 4.3 to 5.3 volts. First detector and I.F. plate voltages, 230 to 270; second detector, 30 to 50; output tube, 230 to 260; rectifier, 340 to 380. The screen-grid voltage of the first detector and I.F. tubes are 80 to 110; of the second detector tube, 30 to 50; of the output tube, 225 to 265. The bias voltage of the first-detector tube is 8 to 10; of the I.F. tube, 3.1 to 3.9; of the second-detector tube, 8 to 12; of the output tube, 16 to 21 volts. The above voltages are valid when a Voltmeter with a sensitivity of 1,000-ohms-per-volt is connected in the circuit with the return lead of the voltmeter to the emitter contact. Bias voltages are measured from cathode to chassis.

The Model 148

Another type of Book Case Receiver, known as the Model No. 148, is a five-

(Continued on page 571)

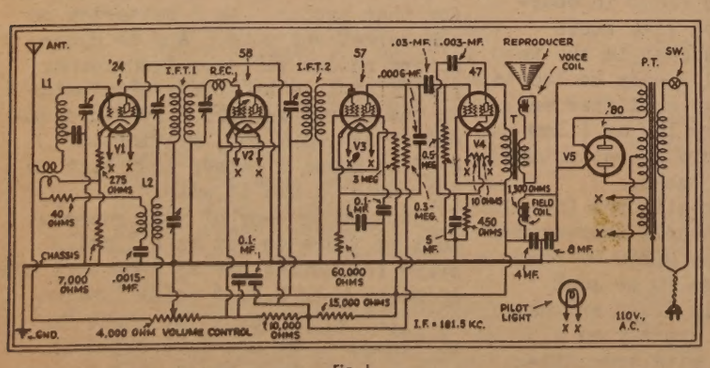


Fig. 1
Schematic circuit of the Crosley Book Case Receiver pictorially illustrated in Fig. A.

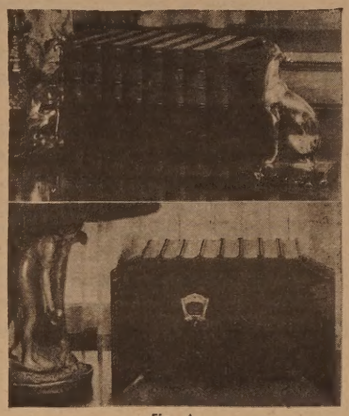


Fig. A
Above, the Book Case receiver closed. Does it fool you? Below, the "books" are opened and the set is ready for operation. This is only one example of how receiver manufacturers may attempt to increase their sales by appealing to the public eye rather than to their ears, which are rather worn out by this time.

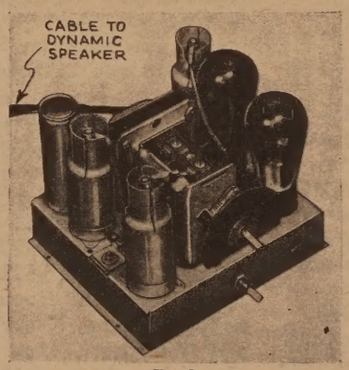


Fig. B
Chassis view of the Model 148 Crosley Book Case receiver. The circuit of this set is different from that shown for the model in Fig. A, above and Fig. 1. A description of this receiver appears in the text.

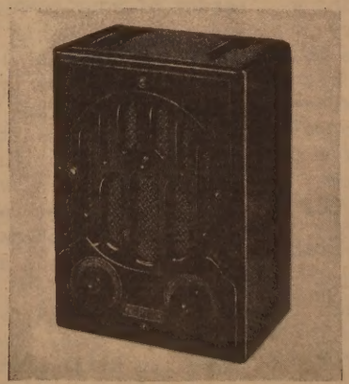


Fig. C
The latest model of Crosley. Known as the "Totem," this receiver, also a midget, while of rather conventional design, presents a striking appearance.

tube superheterodyne for operation from standard A.C. circuits, and having an intermediate frequency of 456 kc. This receiver uses a 58 oscillator-detector; a 58 I.F. amplifier; a 57 second detector; a 42 output tube; and an 80 rectifier.

A photograph of the chassis of the Model 148 is indicated in Fig. B. The compact arrangement of the parts of the completed assembly, and their complete accessibility, is readily apparent from an inspection of the photograph. Of particular note is the fact that while the Model 141, described here, has an intermediate frequency of 181.5 kc., the model 148 has an I.F. of 456. In view of this fact, care should be taken in attempting to line up the Crosley Book Case Receivers. *Be sure you know the model number you are working with.*

The Totem, Model 147

Public fancy has turned towards the ultra compact receiver, and to satisfy this craving, Crosley has announced their Model 147, better known as The Totem. It is a four-tube tuned R.F. receiver designed for operation from 110 volts, either 25 or 60 cycles, or from 110 volts D.C. An inspection of the photograph (Fig. C) shows that the off-on switch and volume control are combined at the lower left-hand side of the panel, while the station selector, or tuning dial, is located on the right. The loudspeaker grille is placed directly above the control knobs, as is evident. The two openings on the top of the cabinet provide space for ventilation, and also act, in a measure, as additional outlets for loudspeaker output.

SILVERTONE MODEL III

Abnormal hum in the Silvertone Model III receiver, a Sears-Roebuck product, usually may be traced to the three electrolytic condensers in the power supply unit; like an electric light bulb, they screw into sockets, and it is the power contact of the spring at the bottom of the socket which causes the condensers to become ineffective.

UNIVERSAL TORPEDO MICROPHONE

BELOW is illustrated the new Universal Torpedo Microphone, a product of the Universal Microphone Co., Ltd. These microphones are completely protected, compact, and readily demountable. Connection is made via spring jacks into which telephone pins are inserted. The case is of heavy brass, chrome-plated for durability.

The Universal Torpedo microphone.

LETTERS

EDITOR'S MAILBAG

Dear Jim:

Here is my $4.50 for a renewal of The Horn Speaker. I could not do without it. So keep the good work up.

I had a fairly good year for finding old radios. I found a Kennedy 220 and a RADA Westinghouse. Also a Radiola X. All are in good condition. I hope to find more this year.

Sincerely
Charles C. Hammon
460 Hilltop Rd.
Covington KY 41015

Dear Jim:

Sure, I want to renew my subscription. Wouldn't be without it.

Had a fairly good year collecting. Found a pair of early Federals and a a pair of Paragons. Just missed out on a DeForest Interpannel. I am starting a shop to Buy, Sell & Repair the old goodies as I am retiring from TV service.

Yours,
Bill Miller
2212 10th St.
Greely, Colo. 80631

Dear Jim,

Enclosed is my check for $5.85 for a years renewal and classified ad. It is a real pleasure to read The Horn Speaker. It brings back memories of the old days around 1921 when I built my first "Wireless Receiver" Radio broadcasting had not started yet. K D K A east Pittsburg PA was the first Station to be received by me in Revere, Mass. Since then I have been active in electronics. Have been in business (for a living) since 1927. I don't think there is an "oldie" that I didn't work on at one time or another. Went on to black & white Television, and then of course Color being licensed in Conn. Was at one time President of North Shore Radio Club in Mass. and have been President of TEISA of Conn. (Valley chapter). Last September I retired and moved up to Winchester NH and work on some of my "Stuff" that I have collected through the years. I also have some live stock plus two ponies a goat and a sheep (lamb) and poultry. Little by little I am selling some of the electronic stuff so that some others can enjoy it. The other day I came across an old notebook from High School Radio Club with old schematics notes and questions & answer columns from Boston Post & Globe way back in 1924. That year we gave a dance at school having music by radio from Drake Hotel Chicago, Ill. Using Magnavox Amplifier with 6 volt powered "Pots" and of course the good old carbon mike. I had two "sound trucks" working for Al Smith in 1928 when he ran for President. I installed amplifiers in planes for Tom Croce (East Boston Airport) that year also.

Wishing you and The Horn Speaker the best for 1976.

Sincerely,
Allan F. MacKay
RFD #3, Manning Hill
Winchester NH 03470

Dear Jim:

Hadn't realized that my subscription had expired. Here is a renewal for two-years. I enjoy your publication immensely! If my subscription ended with the November issue please see that I receive the December '75 one and start the renewal effective with that issue. I wouldn't want to miss an issue.

How about an article on "what to do" when an old set turns out to have a bad transformer. Apart from trying to find a replacement, or sending the transformer out to be rewound, is it possible to rewind one yourself?

Also, I believe that a carborundum detector must require a polarizing voltage to operate. Can anybody tell me what that voltage should be and at what points it should be applied in the circuit?

Thanks for your fine publication.

Sincerely,
Ronald Kramer
134 Coolidge St.
Ashland OR 97520

Editor...Any readers want to help?

Dear Mr. Cranshaw:

There is not much going on in the way of collecting and restoring antique radios and graphophones in my part of the country nor are there hardly any hams nor SWL nor DX standard broadcast listeners.

All of my years of radio listening, which is around 2h years, I always have used those good old wireless sets that use A-battery and B-batteries and usually a C-battery and tube types UV199, UX199, WD11, WD12, UV200, UV201, and UV201-A and UX201-A and I still use these tubes. I still use those same plain detector circuits, regenerative det. circuits, T.R.F. with losser pot., and Neutrodyn sets. I later on have also been using Western Electric Vac. tubes types VT-1, VT-2, 101-D, 101-F, 102-D, 215-A (VT-5), and 216-A.

I once read a suggestion by a reader of your newspaper, that if a person can't locate any 201-A type tubes to keep his old radio in operation, substitute type 71-A audio output tubes in any socket in the receiver. They are still easy to locate, but for use as voltage amplifier and detector they are very low mu (low amplicication) so radio is rather insensitive with these tubes.

I find the best substitutes (if filament rheos. can handle increased fil. current) is type UX210 or the newer 10-Y tube. These 10 or 10-Y tubes are still easily found and has a mu of 8 so perform exactly as a 201-A tube when used with same filament and B and C battery voltages. I will bet these tubes might last forever with such light usage, as these are actually transmitting tubes or audio power output tubes. When used as T.R.F. amplifier or detector or first audio amp. these tubes with 7 volt fil. work just as good with 5 volts fil. current.

In my very old radios made for type UV201 tubes with 1 ampere 5 volt filament, the type 10 and 10-Y and the older UV202, also Western Elect. types 101-D, 216-A, and VT-2 sure work good. And also W.E. type VT-1 if plate voltage not more than 60 volts, the maximum rating of this tube.

I also read a while back in your paper a reader suggested, use a rather short outdoor antenna wire, or even an indoor antenna wire for good selectivity with regenerative detector receiving sets. Now I fully agree with him when I use a simple regenerative circuit with antenna connected either directly or through a series mica condenser (fixed cond.) to the grid tuning coil or a tap on said coil. But with a good three circuit regenerative circuit which has a tuned antenna or primary + a variocuopler + tuned grid or secondary + smooth regeneration or feedback control, the longer the antenna the better. That is up to around 180 feet total length. With the long antenna you simply loosen the coupling between primary and secondary in the variocoupler. The best or optimum coupling amount is that amount that lets you tune the primary without detuning the secondary and vica versa, and you can tune the primary to exactly the same frequency as the secondary without pulling the detector tube out of regeneration or weak self oscillations. When adjusted this way or maybe a little bit looser yet coupling, and both pri. and sec. tuned right on the desired station I can in most cases separate standard broadcast stations that are just 10K.C. apart in frequency and get the weaker station, next to the stronger or nearer station, the stronger station being just barely heard, the weak station just 10K.C. apart, coming in strong. And I get that weak station because of my long and high outdoor antenna wire.

In late years there is getting to be a problem in operating any of the old style battery radios, or even a brand new late model tube type radio for that matter. No B-batteries on the market any more. And no dynamotors and no vibrator-transformer-rectifier type B-battery eliminator on the market anymore. My old dynamotors are worn out, my vibrator systems makes a rather loud buzz in any radio I use it with.

Can you or any of your readers tell me where to get an all solid state (no moving parts) B-battery eliminator with D.C. 6 volts input--D.C. 180 volts output at about 80 milliamp. I am not interested in buying a 110 volt 60 cycle A.C. generator driven by a gasoline engine

just to listen to a modern radio an A.C. radio.

I have tried writing to several people who make modern B-battery eliminators to operate old model radio sets; including G. B. Schneider in Parma Hgts., Ohio, but they make their eliminators to operate only from 110 to 115 volts, 60 cycles A.C. current. All I have are 6 volt storage batteries.

Yours very truly,
LaVerne Laatz
R. Route 1
Marseilles, Illinois 61341

Editor...Need help!

Dear Jim:

I was somewhat disappointed in the size of The Horn Speaker, that I bought from you recently. I am most likely spoiled by being a subscriber to Hemmings Motor News which carries nearly 300 pages of old car ads. However, I am not complaining or whining for my money back, but maybe you can be of help.

You see what I was looking for was a method of getting some kind of a reading on an average price for a whole mess of old radios and repair parts that I have. I should probably sell them as I am not a radio bug, but I don't intend to give them away nor do I believe in asking outlandish prices (like some of them have got to be in the old car hobby).

What I have are things like a Crosley Bandbox, Radiola III, Atwater Kent Model 35, Crosley Trirdyn, Radiola IIIA, three homemade cabinets with all kinds of standard parts assembled into a radio and a couple of boxes of parts of all kinds.

Can you steer me to someone within this area who might give me an appraisal on same? Or is there a magazine that carries a great number of ads for thise things?

Thanks,
A. W. Gaines
2313 Hillside
West Des Moines, Iowa
50265

Editor: Many large things started small. I hope someone in your area reads this letter but I know of no radio publication that can be compared in size to Hemmings Motor News.

VINTAGE SCHEMATIC DIAGRAMS

"Each request for material is a challenge to us, " stated James Lynch, manager of Supreme Publications, "And while most items can be easily and quickly filled, at times our Mr. Beitman (who has been connected with diagrams and servicing for 40 years) spends an hour to find a hard one. 'It's fun,' so he says."

Schematic diagrams and service information on specific Radio and TV sets are available at a nominal charge. Supreme Publications is offering to mail promptly service material on almost any television, radio, or stereo. It is able to supply such information from its own service manuals, from its extensive files of factory data going back to the 1920's, and from manuals of other publishers. The charge is $1.50 and up, and the usual charge is $2.50.

It is interesting to know that there is a large organization ready to supply service material on a radio or a TV set you may find hard to repair and for which you do not have a diagram and other helpful service data. For more information contact, Supreme Publications, 1760 Balsam Road, Highland Park, Illinois 60035.

WORLD STATUS LIST OF ANTIQUE WIRELESS MUSEUMS AND COLLECTORS

By Brent Dingman_Historical Radio Services

This is an interesting list of museums both Public and Private or Amateur, Clubs Associations, Societies, and persons or collectors involved in offering their services to our hobby. The list was compiled by individually corresponding with each party involved and changes each year. As of 10-1-75 these changes are reflected enabling us to keep the Directory up to date. See how much activity there is in your country or states here in the U.S.A.

COUNTRY OR STATE	COLLECTORS/MUSEUMS
Alaska	1
Alabama	9
Arkansas	4
Arizona	17
Australia	4
California	194
Canada	70
Colorado	18
Connecticut	27
District of Columbia	1
Delaware	4
England	2
Florida	30
Georgia	15
Hawaii	3
Idaho	3
Illinois	70
Indiana	84
Iowa	38
Kansas	30
Kentucky	21
Louisiana	11
Maine	9
Maryland	16
Massachusetts	37
Michigan	33
Minnesota	25
Mississippi	7
Missouri	45
Mexico	2
Montana	3
New Hampshire	17
New Jersey	42
New Mexico	7
North Carolina	13
North Dakota	3
New York	102
New Zealand	3
Ohio	49
Oklahoma	12
Oregon	25
Pennsylvania	62
Rhode Island	5
South Carolina	6
South Dakota	4
Tennessee	22
Texas	48
Uruguay	2
Utah	2
Vermont	4
Virginia	16
Washington	33
Wisconsin	22
West Virginia	8
Wyoming	2
TOTAL	1342

SOUTHWEST VINTAGE RADIO AND PHONOGRAPH SOCIETY

A SPECIAL TAPE
Klub members and their kollecting

Klub members and their kollecting..... Several months have passed since Klub members activities was last seen in our News Letters. It seems to me that the gap between the November and January meeting is about four months long. One would think that everyone would have added many radios...'tant' the case, I guess we are just going through too many other activities this time of the year... a few notes of interest....John has advised that I was wrong.... his collection is not in Bonham, but in Marshall, and plans to look at Irving....Jim--"The Abilend Kid", purchased a collection over the Christmas vacation period. This consisted of some 50 radios and "The Kid" is awaiting summer to move them to his ranch in West Texas....by the way, I'd say Jim is one of our more avid collectors----anyone that drives over 400 miles to make a club meeting (I don't think he has missed one yet) has to be real dedicated....Charles (tick-tock) Lamb's Tom Cat is much better now, thank you....Clarence is "setting up" for the McKinney Flea Market and driving back for the club meetings.... John "A" has completed his breadboard ....I missed seeing it, but the report says that it is typical Alford work.. ...T*O*P*S....Basil Abbott is now a resident of Dallas...has bought a home in Richardson and awaiting its completion so he can unpack his collection....first,, no doubt....June Puett'sWife brought a wonderful program on the "Classics"...really super ...we have some plans to video tape it for loans to other clubs....anyone interested?....

OH has started a club Central parts distribution Center. This will work, with modifications, like this....club members that make contributions to the pool are entitled to draw from the inventory in proportion to their part invested. If you have donated a knob ...you can have a tube.... 5 lbs for 5 lbs or vica versa....this can be tied down better at the next meeting. ...hope to see you there...'73s Walt.

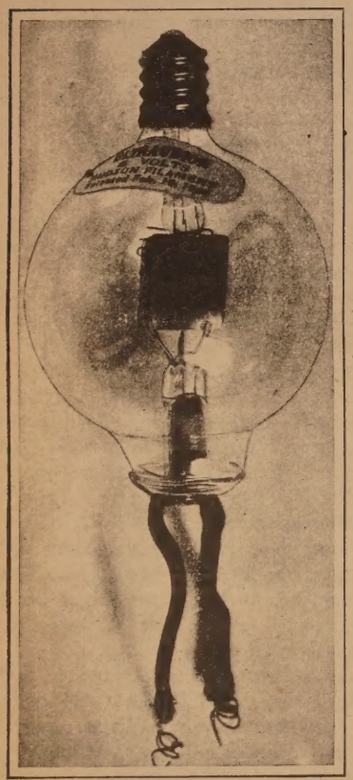
Music from Light

Now that the attention of the public has been drawn to the use of the incandescent lamp, not only as a receiver in transcontinental wireless telephony, but as a generator of power necessary to transmit the voice in the first place it may be interesting to know that this incandescent lamp or audion has another entirely different field of utility—that of producing sound or music.

Tradition has it that on the plains of Egypt, three thousand years ago, the giant statue of the Memni emitted weirdly beautiful notes when struck by the first rays of the rising sun. Today, after three thousand years, it is interesting to know that we have at last reached the point of transmuting light rays directly into sound rays.

In Dr. Lee de Forest's laboratory there are a number of small spherical incandescent bulbs, from which can be obtained a succession of musical notes, clear and sweet, of surprizing volume, the pitch and timbre of which can be varied almost at will to imitate any musical tone of an orchestra.

During the work on the experiments



Paul Thompson
AN ULTRAUDION LAMP

in developing the audion as a wireless telephone detector and incidentally as an amplifier to be used on long distance telephone lines, the discovery was made that when the circuits of the audion were connected in a certain way, a clear musical note was heard in the telephone receiver, which was connected in one of these circuits. The pitch of the notes is very easily regulated by changing the capacity or the inductance in the circuits.

A scale has been arranged similar in function to that of an organ, with switches in place of the ordinary keys, so that by pressing certain keys the operator can cut out, or in, more or less inductance or resistance, thus changing the notes emitted from the telephone receiver at will.

In order to bring out the volume of sound fully it was necessary to connect a number of loud speaking horns connected with telephone receivers similar to those which you have sometimes heard in the central railroad stations as train announcers.

In its simplest form, used as a detector for wireless signals, the audion is a small incandescent lamp about 1½ inches in diameter, containing, besides the usual filament, a grid-shaped wire and behind that again a small rectangular plate of nickel, these elements being sealed inside the glass bulb, together with the filament. This bulb is perfectly insensitive until the filament is brightly lighted, whereupon it becomes, in connection with the aerial wire of any wireless receiving station, a detector of extraordinary sensitiveness.

So sensitive is this audion detector nowadays, that Dr. Austin, of the Bureau of Standards, Washington, D. C., has recently announced that it brings in the signals from the big navy station at Colon, Isthmus of Panama, 20,000 times audibility. The recent work of telephoning from Arlington to Honolulu was made possible by the use of the audion detector or amplifier at the receiving station.

Now, this same little bulb can be made to actually generate alternating current. It receives the energy which is expended in these currents from the dry battery or dynamo. The audion is in other words a transformer of energy. The alternating current, if of low frequency, can actuate the telephone diaphragm and make musical notes which the ear can hear, and this is the idea involved in the musical instrument.

The above 1915 article was contributed by Ross Mason of Mason City, Iowa.

Oldest Victrola Contest Winners Awarded Prizes

The 20 owners of the oldest Victrolas made during the years 1906-1925 to receive cash prizes of $250 each as winners of the Oldest Victrola Contest sponsored by RCA Victor, have been announced. More than 55,000 entries were received.

Each winner receives his prize through the RCA Victor dealer from whom he received his entry, the presentation being made in the dealer's store. *In addition, each of the 20 dealers who actively promoted the contest receives a prize of $250 worth of RCA Victor merchandise.*

A board of judges compared the serial and model numbers submitted by entrants with the old production records.

VINTAGE RADIO HAS GREAT BOOKS FOR YOU!

RELAX WITH A TIME TRIP TO YESTERDAY!

Thousands have already discovered the pleasure of owning Vintage Radio books. You too can enjoy browsing through those pioneer days of wireless and radio. You'll recapture the excitement of wireless days even though they were long before your time. You'll see fine old battery radios of the 1920's, and rediscover "cathedral" radios of the 1930's. You'll relive the dawn of radio broadcasting, visit the radio operator aboard his ship, visit G. I. Joe in his foxhole with his handy-talkie set, and meet the radio "Ham" in his shack.

These experiences and many more await you in Vintage Radio's family of books. Young or old, you'll be fascinated by your journey through those earlier days. You'll also discover the fun and rewards of collecting old-time radio sets and memorabelia.

We have received many enthusiastic letters and book reviews. Some samples may help your enthusiasm too:

"It's a fine, mouthwatering collection . . ."
"So order a copy! You'll love it."
" . . . fascination in every page."
"It brought back fond memories."
"You have the ONE mailing list I'm happy to be on."
"I am enjoying it thoroughly."
"Thrilled over all the pictures . . ."
" . . . educational and delightful."
"Your new book is great. Thank you very much."
"I unwrapped it and I did not lay it aside until five hours later."

YOU'LL BE FASCINATED BY OLD-TIME RADIO!

VINTAGE RADIO 1887-1929

You'll enjoy this fascinating pictorial story of pioneer days in wireless and radio. Relive the days of Marconi, old spark transmitters, and the struggles of early radio broadcasting. It's the radio collector's reference, with over 1,000 pictures on 263 pages.

HARD-COVER $7.95
HANDBOOK $5.95

A FLICK OF THE SWITCH 1930-1950

Here's your time trip through the great days of radio broadcasting and the dawn of television. Revisit the Lone Ranger, Philco "cathedral" radios, old "Ham" days and many more. You'll revel in 312 pages of story, old ads and over 1,000 pictures.

HARD-COVER $9.95, HANDBOOK $6.95

1927 RADIO ENCYCLOPEDIA

Own this authentic reproduction of Gernsback's classic. Browse through radio's heroes (who's Marconi?) and hardware (what's a coherer?) of the old days. 175 fascinating pages. Our hard-cover version is a serialized limited edition, an ideal gift.

DELUXE HARD-COVER $12.95, HANDBOOK $9.95

DISCOVER THE EXCITING RADIO COLLECTOR'S HOBBY!

The phonos are to be turned over to the dealers, who will use them as the basis for outstanding window displays. They will then be shipped to Camden to become part of a permanent historical display. The contest was credited by dealers with having created store traffic, turned up "hot" prospects for new RCA Victrolas, and developed many opportunities to demonstrate the great strides made in the field of recorded music since the old acoustic days.

The winning dealers, together with the year when each winning Victrola was built, follow:

1906, E. E. Forbes, Birmingham, Ala.; 1907, Lansdowne Electric Company, Philadelphia, Pa.; 1908, W. D. Murphy, Summit, N. J.; 1909 and 1910, Jenkins Music Company, Kansas City, Mo.; 1911, Petersen-Harned-Von Maur, Davenport, Ia.; 1912, Oklahoma Appliance Co., Shawnee, Okla.; 1913, John F. Domhoff, East St. Louis, Ill.; 1914, H. Royer Smith Co., Philadelphia, Pa.; 1915, Reynold Helsing, Wahoo, Neb., and Monteen & Dolezal, Wahoo, Neb.

1935 story

1976 ad

ALAN D. R. 6

DUAL REACTION

Employs six tubes. Dual Reaction circuit using 3—58's; 1—56; 1—2A5; 1—80. Built in power supply—utilize Alan silva wound, 3-circuit front plug-in coils, phone jack, dual ratio dial, field supply. Completely enclosed in beautiful crackled metal cabinet.

Complete kit of parts, including 4 sets of coils, cabinet and complete constructional data, list, less tubes and speaker $41.60. Net to amateurs..... $24.95

Wired and laboratory tested additional .....$4.50 Net

Kit of Sylvania tubes for same.....$3.75 Net

8 in. Dynamic speaker to match (Utah, Rola, Magnavox).....$3.50 Net

Order from your nearest source of supply.

ALAN RADIO CORP. 172 Washington Street New York, N.Y. Dept. R. 1 1028 South Olive Street Los Angeles, Calif.

1935 ad

1916, The Wilson Music House, Maplewood, N. J.; 1917, the Seymour Shop, New Canaan, Conn.; 1918, The Foster Shop, Lafayette, Ind.; 1919, Market & Broad Radio-Music Co., Newark, N. J.; 1920, Cicero Radio Laboratory, Cicero, Ill.; 1921, Wurlitzer Co., Columbus, O.; 1922, Heim's Music Store, Inc., Danbury, Conn.; 1923, Checker Electric Supply Co., Cedar Rapids, Ia.; 1924, Spiros, Hicksville, N. Y.; 1925, Wurlitzer, Cincinnati, O.

RADIO-CRAFT for MAY, 1939

WEBSTER-RACINE

High Impedance magnetic pickup head. One of the finest pick-up units made. Head only. Sh. Wt. 1 lb. $1.69

Webster-Racine arm to fit head Sh. Wt. 2 lb. $1.29

Unit complete Sh. Wt. 3 lbs. $2.98

Send Cash or Money Order, add Postage. Send for our 32 page Bargain Catalog. WE SAVE YOU MONEY

ARROW SALES COMPANY
619 W. RANDOLPH ST. CHICAGO, ILLINOIS

1939 ad

1932 ad

CROSLEY offers the Greatest VALUES in Radio at lowest possible prices

SUPERLATIVE *performance at the lowest possible price!* This requirement is uppermost in the minds of those who today are contemplating the purchase of radio receivers. And so in accordance with the Crosley policy of providing what the public will buy, Crosley has set about to meet this demand.

The low Crosley prices attract prospects to your store.

In doing so, Crosley engineers and technicians have left nothing undone to give you, the radio dealer, and in turn, your customers, the greatest and most sensational values that have ever been offered in the radio industry. Consequently, Crosley radio receivers are in demand today. And they are priced so that the radio dealer can operate at a profit — TODAY.

Today's "buyers' market" has put its stamp of approval on the amazing Crosley models. It has professed its satisfaction in terms of greater sales. So perfectly does Crosley reflect the needs, requirements and taste of the radio-buying public that *no dealer can afford not to handle Crosley.*

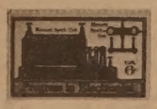
The Crosley Radio Corporation

POWEL CROSLEY, Jr., *President*
Home of *"the Nation's Station"*—WLW
CINCINNATI

YOU'RE *THERE* WITH A CROSLEY
CROSLEY RADIO

1976 ad

OUR BOOKS AREN'T ALL - WE'LL BEAUTIFY YOUR WALL!



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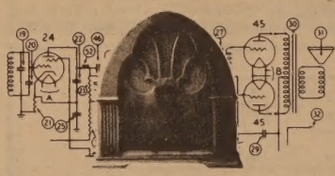
CIRCUIT DIAGRAMS



We will research any pre-1951 radio model and send you the circuit diagram and any other available repair information. We'll also tell you the year in which that model was introduced. Your money back if we don't come up with at least a circuit diagram!

We now have Canadian diagrams, too!

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The Newcomer

VACUUM TUBES CONTINUED
By O. H. McDonald

The secret to receiving, detecting and amplifying the weak incoming signal to a radio receiver is the triode vacuum tube. In the early days these tubes were referred to as electrons valves because the electron flow could be controlled as water thrcugh a valve. I might add at this point I do have a couple of British early radio recievers that refer to the vacuum tubes as 'valves'. Anyway, for almost a decade the triode was the radio tube. This tube consisted of the filament (cathode), grid and plate. Around 1927 the tube #27 came in, but basically this was the same tube except the electron emitter consisted of a metal shield covering the filament. The filament heated this metal which was coated with material for easy electron boiling off effect. These were made for the all electrics.

Between the filament and the plate was placed a wire grid. The grid is much closer to the filament than the plate and hence a charge on the grid has much more effect on the flow of electrons than a similar charge on the plate. A small negative charge on the grid would repel electrons and oppose their flow to the positive plate. On the other hand a slight positive charge would help the electrons across the vacuum to the plate, however, being positive to the grid would draw a small amount of electrons. Thus by varing the negative charge on the grid, the flow of electrons through the tube can be controlled and thus the plate current is controlled as this flow through the tube is the plate current.

The negative charge between the grid and filament is referred to as bias. By increasing this bias or negative charge on the grid the flow of electron can be slowed down and even to no flow at all.

Batteries were sometimes used to maintain a grid potential on the negative side and these were called 'C' batteries. The positive side of these batteries were connected to the filament and the negative side back to the grid.

In future articles I will cover how amplification is achieved with the triode tube but in the meantime keep those letters coming.

1915 Edison ad contributed by Ross Mason.

Sensitivity SHURE Tone Quality
MICROPHONES
SHURE BROTHERS COMPANY
Manufacturers • Engineers
S.N. SHURE, Pres.
337 WEST MADISON ST. CHICAGO, ILLINOIS

1933 ad

1976 ad

1933ad

New!
UNIVERSAL MODEL "E"
Condenser Type Microphone

Amazing quality at a sensationally low price. 90° Swivel Head with Automatic Barometric Adjustment — 2-Stage Amplifier — Non-Microphonic Tubes—Solid Bar Grating Diaphragm Protection —Polished Aluminum and Chrome Plated—At dealers' net cost of $54.00, this is by all odds the greatest value in microphone history.

UNIVERSAL MICROPHONE CO., Ltd.
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INGLEWOOD, CALIF., U. S. A.

NEW PUETT ELECTRONICS
SUPER ANTENNA - GROUND SYSTEM
designed by J.W.F. PUETT - extremely high gain for use with all types of antique radios - omni-directional - inexpensive and easy to build - requires very little space ------
COMPLETE CONSTRUCTION INFORMATION $2. postpaid

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SUCCESSOR TO
The Scott News & The McMURDO SILVER TIMES

THE 40 TUBE SCOTT QUARANTA - FEATURED IN THE JANUARY/FEBRUARY ISSUE OF THE CLASSIC RADIO NEWSLETTER
1976 subscription $5.00 - four or more pages - six issues per year.

Orders for Silver Ghosts are still coming in slowly - we should reach our goal soon and be able to offer the book photo offset printed instead of reproduction by photocopy.

SEE OUR LARGE AD ON THE BACK COVER

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BY JWF PUETT
PHOTOGRAPHS - SCHEMATIC DIAGRAMS - STORIES
OF EVERY KNOWN RECEIVER MANUFACTURED BY
THE E.H. SCOTT RADIO LABORATORIES
70 PAGES FROM PHOTOCOPY 10.00 POST PD
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THE INDEPENDENT 107

EDISON DAY
OCTOBER 21st

Edison's Dream Comes True

EDISON MAZDA LAMPS

In Millions of Homes the Country O'er

—the fullest appreciation of Edison's invention of the incandescent lamp is now based on the bright, white brilliance of its successor of the present day—the EDISON MAZDA LAMP.

Three times as economical to operate as your old-style carbon lamps, your greatest saving comes when you put EDISON MAZDAS in every socket.

Make your home radiant with the three times greater brilliance of EDISON MAZDA. Your lighting company or nearest Edison agent will gladly help you choose sizes best suited to your needs.

EDISON DAY—October 21st—is the 36th anniversary of the invention of the incandescent lamp. Thirty-six years' experience in lamp making is summed up in the EDISON MAZDA LAMP of today.

EDISON LAMP WORKS
OF GENERAL ELECTRIC COMPANY
General Sales Office, Harrison, N.J.
Agencies Everywhere
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PHONOGRAPH ARTICLES COMING

Up and Down the Waves with the Scott "All-Wave" Superheterodyne

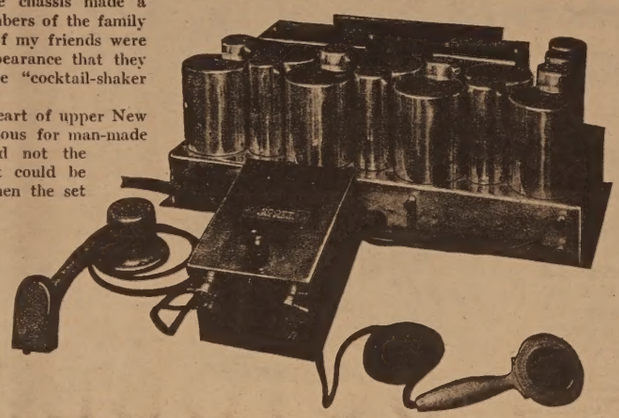
An Evening with "DX" stations on the Long Waves and A Morning with Foreigners on the Short Waves

By MARCELLUS H. GERNSBACK

HAVING heard many favorable reports about the new Scott all-wave superheterodyne receiver, the writer was delighted at the opportunity to take one of these powerful 12-tube sets to his home for a thorough reception test.

The appearance of the chassis made a hit with the feminine members of the family at first sight; and some of my friends were so taken up with its appearance that they insisted on calling it the "cocktail-shaker receiver"!

The location is in the heart of upper New York City, a place notorious for man-made electric interference, and not the best reception spot that could be desired. Nevertheless, when the set was turned on, interference was found to be much less than had been expected; a result due to the high selectivity of the receiver and intermediate frequency amplifiers' tuning circuits, no doubt.



"The cocktail-shaker" chassis was so described because of its modernistic, all-chromium finish. It is, however, designed for all the demands of an exacting set owner—including microphone and phonograph pick-up, as well as recording, accomplished with the aid of the control box in the foreground.

The first test was for tone quality on local stations. The set came through this with flying colors; for the quality was remarkably fine, from the bass register way up to the treble range. The quality, moreover, was practically unaffected by the setting of the volume control; either soft or loud reception was excellent.

While testing the receiver on local stations, it was found that the kilocycle calibration of the two tuning dials is very accurate over the broadcast band.

Distance Work on Longer Waves

When this was thoroughly checked, the writer decided to go fishing for some out-of-town stations, though without expecting much success, since it was then only 9 P.M. (daylight saving time) and the date was June 29—only a week after the longest day in the year. One must admit that these are unfavorable conditions for distant reception on the broadcast band; especially in New York City, with about thirty local stations on the air.

I was in for a surprise, however; for I was able to pick up a large number of out-of-town stations with good loud-speaker strength. (See station list.) These transmissions came in, not only loud and clear, but also with no trace of interference; even when the distant station happened to be adjacent to the channel of a powerful local. The receiver was obviously as selective as any set need be. This super-selectivity did not, however interfere with the receiver's audible-frequency response; as so often is the case in a highly-selective tuner, which cuts the sidebands.

One of the most difficult tests in New York City is to separate WOR, on 710 kc., from WLW on 700 kc. An outfit which can do this has "got the goods," as the saying goes. With the Scott receiver this feat was very easy to perform; WLW could be tuned in with no troublesome intereference from WOR.

During this early-evening session, about 35 out-of-towners were pulled in. One pleasing feature of this performance was that all these stations came with the same strength and quality as the local transmitters.

After I had satisfied my curiosity on these points of selectivity, quality and sensitivity, I decided to sit back and enjoy one of the local programs for a time. This was a decided pleasure, and the time passed so rapidly that it was midnight before I realized the hour.

Strong "DX" Reception

I decided to have a try for "DX" again. This time I had much more success; for the distant stations which literally "poured in" were much further away than those heard earlier. Unfortunately, man-made static had become very annoying in my locality, and it was found impossible to listen with the volume control turned up more than two-fifths of the way. For this reason, the receiver was not able to show that night what it could do when pushed to its limit. Despite this handicap, the performance was quite remarkable for summer conditions. The reception log, it will be observed, contains stations in Texas, Colorado and Mexico.

At this point, it might be well to mention that this station log contains only those stations which were listened to long enough to hear their call letters. If all the stations heard had been logged the list would be about double its present length.

The receiver was not tested after one o'clock in the morning; so that no opportunity was had for picking up any far western stations; but the tests were so satisfactory that I am convinced that European stations can be heard on the broadcast band during the winter.

Daylight tests with the receiver showed that stations up to 300 miles distant can be easily picked up without advancing the volume control beyond the half-way mark.

Short-Wave Reception

On the short-waves, the receiver showed up exceedingly well. Tone quality still remained very fine—an unusual feature for a short-wave set. The annoying rushing noise, familiar to users of regenerative short-wave outfits, was noticeably absent.

The Scott set was checked on the short waves by comparison with the reception from a four-tube receiver using one tuned screen grid ('24) stage of R.F. amplification, a regenerative ('27) detector, and a two-stage audio amplifier (also '27s). During previous tests with the four-tube outfit, European stations had been coming in for over a month with only fair strength, with but few exceptions. Station G5SW at Chelmsford, England, relaying the national programme from the London studios of the British Broadcasting Company on 25.53 meters (11,750 kc.), was first tuned in. On the superheterodyne, the programme was as loud, with the volume control advanced only a quarter of the way, as it was on the four-tube set with its regeneration control advanced to maximum. Because of the absence of regeneration in the super, its quality was much better than that of the regenerative set.

Once again that bugbear of radio, man-made static, interfered. On this occasion it was augmented by the interference from the ignition system of automobiles passing in the street. This noise made it impossible to test the set with the volume control advanced any further than the halfway mark.

SHORT WAVE STATIONS HEARD
with the Scott All-Wave Superheterodyne

16.36	WND—Lawrenceville, N. J.
16.38	GBS—Rugby, England
	And other transoceanic phones, "scrambled")
16.82	PCV—Kootwijk, Holland
25.24	W8XK—Pittsburgh, Pa.
25.42	I2RO—Rome, Italy
25.53	G5SW—Chelmsford, Eng.
25.63	FYA—Pontoise, France
31.38	....Zeesen (Konigswusterhausen), Germany
48.80	VE9CL—Winnipeg, Canada
48.86	W8XK—Pittsburgh, Pa.
49.02	W2XE,—New York City
49.18	W3XAL—Bound Brook, N. J.
49.50	W8XAL—Cincinnati, Ohio
49.83	W8XF—Chicago, Illinois
84.50	up—Amateur phone stations

Long-Wave Broadcast stations heard with the Scott All-Wave Superheterodyne

Before midnight

WBZ—Springfield, Mass.
KDKA—Pittsburgh, Pa.
WHAS—Louisville, Ky.
WGY—Schenectady, N. Y.
WBBM—Chicago, Ill.
WJR—Detroit, Mich.
CKAC—Montreal, Canada
WLW—Cincinnati, Ohio
CKGW—Toronto, Canada
WPTF—Raleigh, N. C.
WDBJ—Roanoke, Va.
WIP—Philadelphia, Pa.
WICC—Bridgeport, Conn.
WLIT—Philadelphia, Pa.
WFBL—Syracuse, N. Y.
WJAS—Pittsburgh, Pa.

After Midnight

WBT—Charlotte, N. C.
WHO—Des Moines, Ia.
WENR—Chicago, Ill.
WFAA—Dallas, Tex.
WRC—Washington, D. C.
WFIW—Hopkinsville, Ky.
WTAM—Cleveland, Ohio
WTIC—Hartford, Conn.
KYW—Chicago, Ill.
WOC—Davenport, Ia.
WGN—Chicago, Ill.
WBEN—Buffalo, N. Y.
WAPI—Birmingham, Ala.
Two Mexican stations, one on 910 kc.; the other about 740 kc.
KRLD—Dallas, Tex.

Daytime. (10 A.M.-5 P.M.)

WIP—Philadelphia, Pa.
WLIT—Philadelphia, Pa.
WICC—Bridgeport, Conn.
WGY—Schenectady, N. Y.
WTIC—Hartford, Conn.
WPG—Atlantic City, N. J.
WRVA—Richmond, Va.

Other stations heard with good volume on the short waves included I2RO at Rome, Italy; FYA, the new colonial government short-wave broadcaster at Pontoise, France; the German broadcasting company's station at Konigswusterhausen; both ends of the transatlantic phone system; (London-New York); a Dutch phone station communicating with the island of Java; and some North American broadcasters — W8XK, Pittsburgh; W2XAF, Schenectady; W9XF, Chicago; W9XAA, Chicago; W8XAL, Cincinnati; W2XE, New York; W3XAL, Bound Brook, N. J.; and VE9CL, Winnipeg, Canada.

The selectivity was far better than anything I have ever tried on the short waves. With the four-tube set W8XK on 25.24 meters was overlapping I2RO on 25.42 meters, and also G5SW. With the "super," there was no trace of interference on either of these stations.

Tuning on all waves was very easy and lacked that "critical" action found in most all-wave sets.

Convenient Wave-Changing

The manufacturer supplies, as part of the regular equipment for the Scott receiver, two sets of plug-in coils for the short and broadcast waves (12 coils in all). These are very easy to insert and remove. On the coils from 15 to 38 meters, the clips to the control-grid caps of the first R.F. and first detector tubes are attached to two red-covered wires. The antenna is connected directly to one of these clips and through an R.F. choke to ground.

For the waves from 38 to 184 meters, the control grid connections are red to the first R.F., and black to the first detector. For the broadcast coils (200-550 meters) the connections are black, to both tubes. The antenna, for this work, is connected to the regular antenna post at the rear of the chassis.

The Scott "short-wave station finder" is a neat little gadget, supplied with the set, to determine the dial setting for any given wavelength. One merely sets the indicators to the wave desired and—presto—above it appears the coil number for that wave, and also the dial setting of the receiver. It is then a simple matter to insert the designated coils in the receiver, and set the dials according to the station finder's instruction. This ingenious device saves much time and bother.

"FIND OF THE MONTH"
Coming next month

Club News

The Mid-America Antique Radio Club had a great meeting November 9 with a guided tour of the WDAF Station, one of the earliest in Kansas City. Our January 25 meeting brought 5 inches of snow but some braved the storm to come and have meeting on restoration of old sets. Vern Petersen gave nice talk on how he makes knobs and parts for sets. He even replates brass parts, builds new cabinets, make new loop antennas & makes new copper belts for ganged tuning.

Our club has grown to 72 and dues are still $1.00 a year. Next meeting March 28 at the Kansas City Museum - Program on history of KMBZ with the Chief Engineer as guest speaker.

Tips: Use your resistance - cap. tester like Eico to repair audios. Use elect. test with adjustable voltage output. Eye will close when healed and max. current is only 10 ma. Also repairs headphones and speakers.

Bob Lane
2301 Independence Ave.
Kansas City MO 64124

article coming
Rejuvenate Old Tubes

Leaves from Service Men's Notebooks

Problems of a more or less unusual nature, and solutions which RADIO-CRAFT'S *readers have worked out*

OLD MODELS—AND BAD TUBES

By J. Paul Miller

IN an Atwater Kent early model electric set that is dead, when no plate voltage shows on the detector tube, it is probably due to the phone condenser which is connected from plate to ground; this is either shorted or leaky. Remedy by replacing. The first diagnosis is, naturally, the resistor in the power pack or the primary of the first audio transformer.

In an old model Steinite series-filament receiver, that would not tune above 30 on the dials, the trouble was traced to a short-circuit in the third variable condenser. (This short was in the bearing, and not in the plates touching.) This resulted in the last tube on the chassis being cold. The remedy was to rewind the primary just like the original, and find and correct the short-circuit.

In the Sparton "Model 89A" a baffling problem presented itself in that the volume control was of no effect. The control was not at fault, but a tube was found with a leak between the heater and the cathode. This often happens in new tubes, and a wise Service Man will check very carefully on this item first.

In using a set analyzer remove the tube very carefully, so as not to jar it in any way, and insert in the analyzer; if the tube is jarred the leak may not show up. Perhaps the better way is to remove one tube at a time from the radio-frequency can, and try the volume control with the set analyzer plugged into one of the sockets. When the leaky tube is located the volume control will function; and you will see that the plate current can be controlled from zero to about six or seven ma. (Never have more than one tube out of the circuit at any one time; otherwise a damaged tube may result.)

A Starck old-model electric set would not tune anything with the aerial and ground connected in the proper way. This was found to be due to a short-circuited primary on the first radio-frequency transformer, and remedied by rewinding or replacing the transformer.

Many fading problems may be traced to a cracked filament in a '27 detector tube; watch this tube and you will see it light up and then go out when it gets hot.

Also, fading and weak reception may be traced to the lightning arrestor's being shorted or a broken connection at the terminal. Moral, test this first when a set lacks volume or, especially, if it will not tune on the higher wavelengths.

A resonance hum on push-pull output is not always coming in on the power lines and, often, you will find one of the power push-pull tubes out; this manifests itself by a decided hum when the receiver is tuned to one of the low wavelength stations. See that the tubes are both working.

REPAIRING SPEAKER CONES

By John J. Nothelfer

HAVING bought several speakers with damaged cones (at a good price and with an idea of reselling at a profit), I learned much to my chagrin, the prices for new cones! The prices were so high that a loss instead of a profit would result.

The speakers were damaged at the centering device; this is the case with nearly all damaged cones. I tried repairs, and with good success, after several attempts.

Cutting out the damaged area, I sandpapered the edges of the cut to a rough finish. Cutting a piece of paper from an old cone, I pasted the patch to the damaged area, with white collodion.

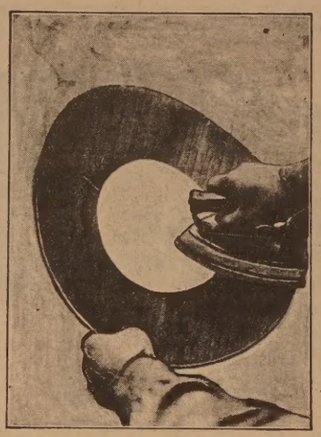


Fig. A

Mr. Nothelfer does a little valet work on an old-fashioned paper cone.

It takes a while to dry, and the patch must be held in place all that while, probably an hour. The ordinary hot iron came to the rescue. After raising it to a good, hot "heat," I pressed the iron over the pasted area. In a few minutes the collodion had dried, and it held as firm as if the patches were metal and soldered! To prevent the collodion from getting to the surface of the iron, a piece of paper is laid over the area to be heated.

A new centering device should be installed and the cone replaced on the speaker. The cone is then as good as new, and no fear should be entertained that the pasted patch will come loose.

This idea also works very well with dynamic speakers which have been punctured by accidental means; in this case, ordinary typewriter paper is used.

THREE SET HINTS

By Helmers J. Huebner

IF an Apex "Model 80" gives low volume and a popping noise, see whether the volume control is touching the metal shield. It should be centered and tightened.

When a late 1930 model Apex begins to motorboat, or give harsh tones and incorrect tube readings, it is an indication that the small condensers are out of step. They should be adjusted with the shield in place, by the aid of an output meter.

When an Atwater Kent gets noisy, look for a dirty volume control, in almost any model. The cure is a good cleaning with gasoline.

MULTIPLE SPEAKERS

By Victor Trad

A SIMPLE and economical method of wiring every room for a radio speaker, illustrated here, obviates drilling holes through the ceiling or floor; because one wire may be taken upstairs or downstairs from the outside of the building. I have used the idea quite successfully in making such installations in my neighborhood, and they are working quite well. The arrangement shown lessens losses caused by the use of two wires. (Fig. 2)

A volume control, and a switch also, may be used in each room, if desired by the set owner; convenience outlets are obtainable, or ordinary electric wall receptacles may be made to serve. The condensers used are of 2-mf. capacity. That attached to the receiver's output is connected to the ground post of the set, when the latter runs directly to the radiator.

(The method shown will be of value to many Service Men who are prepared to add a profitable extra to installation work. It is desirable, perhaps, to add a caution that the use of speakers in parallel reduces the impedance and, thereby, the total effective output of the set to all of them. The new pentode, particularly, requires a large output impedance, as explained elsewhere in this issue. However, if more than two speakers are required, the use of a series-parallel connection will restore the matching of the load to the output tubes. On this subject, it will be of interest to refer to the paragraph "Matching Reproducer Impedance," in the article on page 727 of RADIO-CRAFT for June, 1931; while a very large installation is described therein, the principle is the same.—*Editor*)

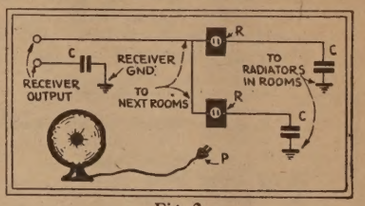


Fig. 2

Mr. Trad finds this method of wiring several speakers to a receiver simple and profitable.

IRREGULAR BIAS READINGS

By Frank E. Chambers

HERE was the problem: three '26 R.F. tubes, all biased by a single resistor from filament center-tap to ground, normal filament and plate voltages on all tubes; grid bias on first and second tubes slightly high, none on the third, and plate current on the third three times normal.

Under other circumstances (as with '27 tubes) I would have said immediately—"Biasing bypass condenser shot." But when all are biased by the same resistor—!

A continuity test disclosed an *open* in the secondary of the third R.F. coil, and on taking off the shield can, a poorly-soldered joint was found. Re-soldering the joint restored everything to normal.

I had never, in five years of service work, struck this particular condition; and this hint may save some fellow a lot of time.

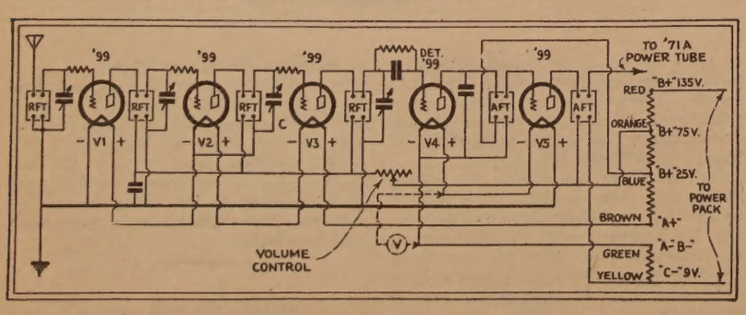


Fig. 1

This diagram of the tuner of an old Steinite model ("991," "992," "993") shows the series-filament arrangement. As Mr. Miller points out, a grounding of the third tuning condenser cuts out the filament of the first tube.

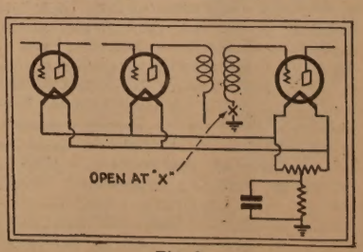


Fig. 3

In an old-fashioned, low-voltage receiver, an isolated grid would block. Now, as Mr. Chambers finds, the tube runs a high plate current.

The HORN SPEAKER..... 9820 Silver Meadow Drive, Dallas, Texas 75217

THE SATURDAY EVENING POST February 2, 1924

A Radio Statement to the Public

The Meaning of Coördinated Scientific Research

KEEPING its pledge to the public, the Radio Corporation of America has concentrated its vast research and engineering forces upon the solution of certain fundamental problems facing the art—problems which have become more apparent as broadcasting stations and radio receivers multiply.

The phenomenal expansion of the radio industry, and the universal and ever-increasing appeal of radio represent an outstanding development of the present century—for this industry has grown from infancy to maturity in a space of but two years.

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Briefly stated, there is today a necessity for

—***A radio receiver providing super-selectivity*** —the ability to select the station you want—whether or not local stations operate. A selectivity which goes to the theoretical limits of the science.

—***Super-sensitiveness***—meaning volume from distant stations—along with selectivity.

—***Improved acoustics***—more faithful reproduction of broadcasted voice and music than has ever been possible before.

—***"Non-radiating" receivers***—a new development, a type of receiver which, no matter how handled, will not interfere with your neighbor's enjoyment.

—***More simplified operation***—a super-receiver requiring no technical skill, thus making the great fund of radio entertainment immediately available to all members of the family.

—***A receiver for the apartment house*** and populated districts, requiring neither aerial nor ground connection.

—***Another type of improved receiver for the suburban districts,*** equally as capable as that above, for use where the erection of an aerial presents no problem.

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Painstaking search in quest of these ideals has led to new discoveries setting new standards of excellence and performance—discoveries which have established:

First—that improved acoustics are possible—a matter of scientific research and not of haphazard design—for truly melodious reception.

Second—that dry battery operated sets can be so designed, as to give both ***volume*** and distance.

Third—that the regenerative receiver is susceptible of marked improvement providing selectivity, sensitiveness and simplicity of operation hitherto deemed impossible of accomplishment.

Fourth—that the Super-Heterodyne—the hitherto complicated device requiring engineering skill to operate—could be vastly improved—improved in sensitiveness and selectivity—and simplified so that the very novice and the layman could enter new regions of entertainment and delight.

Watch For Further Announcements

Radio Corporation of America

Sales Offices:

233 Broadway, N. Y. C. 10 So. LaSalle St., Chicago, Ill. 433 California St., San Francisco, Cal.

Radiola

REG. U. S. PAT. OFF.

THIS WAS RADIO

BOOK REVIEW by Fred L. Davis

THIS WAS RADIO by joseph Julian with introduction by Harold Clurman. The Viking Press. $8.95. 238 pages.

Some antique radio collectors are only interested in the sets and electronics, forgetting that the radio was only a means to an end. The vast amount and types of old radios are only available because of the tremendous demand on the part of the public to hear the entertainment that was coming over the air-waves. It is with this in mind that I say to put away the schematics for awhile and have some fun. This book is not a heavy-weight history of the entertainment industry of radio. It is, however, a fascinating set of experiences by a radio actor who was in great demand. Julian was on just about every major radio program at one time or another. For example, he specifies the shows he did during one month in 1943. His records indicate that he appears on 28 different radio series during the month including: Inner Sanctum, Mr. District Attorney, The Thin Man, Superman, .. Reader's Digest, Gangbusters, Stella Dallas, Charlie Chan, and The Goldbergs. To me there are two particularly interesting segments of the book. One, detailing his experiences in war-time radio in England and after the war with the occupation forces in Japan. During the war, Julian was broadcasting for Norman Corwin in the series, AN AMERICAN IN ENGLAND, trying to give the American people pictures of the war-time struggles of the English people.

In 1945, Julian went to Japan to do broadcasts concerning the occupation by the American forces under ... General McArthur. Julian spent six months in Japan doing broadcasts. One broadcast in particular was on the Reverend Kioshi Tanimoto, who was one of the six persons telling their personal experiences in John Hersey's book, HIROSHIMA. Julian also read Tanimoto's story as part of a one-hour ABC radio program on Hersey's book, HIROSHIMA.

The second particularly interesting segment deals with Joseph Julian's doubts about the creative aspects of acting in radio. These doubts led to an article in the January 15, 1941 issue of VARIETY entitled, AN ACTOR ANALYZES RADIO ACTING by Joseph Julian. The article created a storm of controversy continuing for a period of time with written responses/criticisms/agreements from many people in the field, including Les Tremayne, Bing Crosby, Gene Autry, Chester Lauck (Lum and Abner), and others. The original article is reprinted, along with several of the responses, in the book.

In conclusion, let me say that I enjoyed the book. While you could not "make a meal" out of this book, desserts are nice also.

1906 ad

Music on the Waters

WITH THE EDISON PHONOGRAPH

If you intend to spend your vacation near the water or on a launch or yacht, you should surely take a Phonograph with you.

Music on the waters has a charm all its own. The sounds of voices or instruments are softened and sweetened in the open, and the surface of the water reflects the pleasing harmonies far away to the cottages along the shore.

Hardly a pleasure boat leaves its harbor without a Phonograph aboard. It takes up little room, cannot get out of tune, and affords a greater variety of entertainment at less cost than any other musical instrument.

On a boat, at the farm, or in the city home, it is the ideal entertainer: portable, requiring no skill to operate, instantly ready to sing any kind of vocal music or reproduce any instrument or combination of instruments, and—best of all—low in price.

Hear one at your dealer's free of charge. Write for Booklet "Home Entertainments With the Edison Phonograph," and name of nearest dealer.

National Phonograph Co., 18 Lakeside Ave., Orange, N. J.

New York: 31 Union Square

TRADE MARK Thomas A. Edison

MART

Classified ad rate: 6¢ per word.
Photo ads: $2.00 extra.

MISC.

PHONOGRAPH COLLECTORS, join the American Phonograph Society. Receive the quarterly Journal and four Newsletters. Receive free reprints and stereoscopic phonograph cards. For more information send 10¢ stamp. For one year membership, send $6.50. The American Phonograph Society, P.O. Box 5046, Berkeley CA 94705.

FOR SALE OR TRADE

COMPLETE SET of Supremes "Most Wanted Schematics" 1926-1950 ten volumes, all original $50.00.
Ryder TV manuel #1 $5.00.
201a tubes all tested $5.00.
3 David Grimes coils in original cartons $15.00.
Ronald F. Hill, 386 Roosevelt Ave., Lyndhurst, N.J. 07071.
Phone: 438-5838.

FOR SALE: Authentic reprint of A.H. Grebe sales brochure. Includes many pictures and descriptions of CR-3, CR-5, CR-8, CR-9, RORK and RORD, $2.25 p.pd.
Authentic reprint of A. H. Grebe Instructions for Operating. Contains 64 pages of hook-ups, schematics and graphs for CR-3, CR-8, CR-9, RORK, RORD, and RORN, $3.95 p.pd. Mail check or MO to Don Patterson, 1220 Meigs Street, Augusta, Ga., 30904.

SWAP: Have Radiola III, Aerola Sr, Kennedy 281, DeForest Interpanel, DeForest Everyman, Erosley Pup, Radiola Sr, F.E. NR-5, Riders Vol. 6, 7, 8, 10, Duck Cat. #16. Want early sets like Grebe, Paragon, 1P-501. Send SASE. Robert A. Lane 2301 Independence Ave., Kansas City MO 64124.

CLOTH COVERED POWER CORD. New 2-conductor cord as used on AC sets of the twenties, thirties, forties. From old stock, limited quantity. In brown or gold 25¢/foot. Please add 50¢ for mailing. Warren Dewey, 5021 Ambrose Ave., Los Angeles CA 90027.

FOR SALE OR TRADE

SPEAKER GRILLE CLOTH. Two new styles now available. (Styles #1, 2, 3 sold out.) Fine, silky 20's - 30's style fabric. 24" wide $4.00/yard, plus 25¢ mailing. SASE for samples. Warren Dewey, 5021 Ambrose Ave., Los Angeles CA 90027.

SEND SASE for list of 1920's radios. Not "scalper's" prices! Arthur Harrison, 1021 Falcon Dr., Columbia MO 65201.

FOR SALE: "The Evolution of the Phonograph" 6 part serial, 1955-56 Radio-TV News $20.00. "Magnificent Failure" 3 part serial on DeForest, 1942 Saturday Evening Post, $10.00. Both serials complete, nicely illustrated and postpaid. Greg Dockter, 2519 Ave. C, Bismarck, N. Dak. 58501.

FOR SALE: Cabinet only for an AK model 47 and cabinet only for Splitdorf Abbey Single Dial Receiver. WANT: Cabinet only for table model AK 33. Dan S. Gaidoaz, 342 West River Road, Orange, Conn. 06477.

RECORD CATALOGS, 1900's - 1940's, for sale. Send stamp for large, descriptive sales list. Will buy individual catalogs or collections. Tim Brooks, 1940S 80th Street, Jackson Heights, New York 11370.

Schematics and or Manuals Monacor by Monarch Electric - STA-150X Chassis 14267 KS. Superior Instrument Chenometer TV-50. Knight Signal Tracer, Knight Capacitor Checker. Charles T. Allen, 6746 Parkinsonia Dr., Miami Lakes FL 33014.

FOR SALE: 25 sets; battery, crystal and electric. All very desirable. Pup; Federal; Airway; Crosley; RCA (many extras). $1000. for all. Will not ship. Alan Diaz, 24 Mars Ave., Warwick R.I. 02889. 401 738-7895.

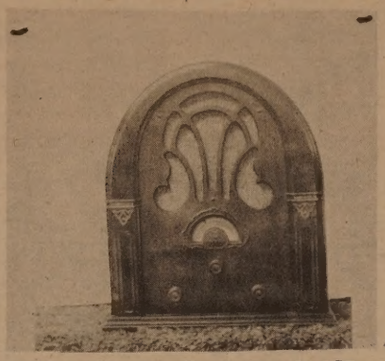
BLANK BAKELITE STOCK cut to size, 1/8" to 1/2" thick. Fabricating and engraving services available. SASE for pricing sheet. Norman A. Parsons, 22 Forest St., Branford CT 06405, Phone: 203 488-4267.

FOR SALE: Pilot 3" Television $275. RCA Radio $60.00. More radios. Many televisions from 1930s - 1940s. WANT horn phonographs, old radios and televisions. Charles Seidel, 614 Grove Lane, Santa Barbara CA 93105. Phone: 805 687-7967.

FOR SALE OR TRADE: Early QST's, CQ's, Radio, call books, handbooks, tubular Audiotrons, Electron relays and early receivers & parts. Erv Rasmussen, W6YPM, 164 Lowell St., Redwood City, California 94062.

SEND $1.00 for the newly published booklet "A Pocket Guide to Antique Radio Collecting." Antique Radio Press, Box 42, Rossville IN 46065.

FOR SALE OR TRADE



FOR SALE: Atwater Kent Model 387 cathedral. Excellent condition, works good. $100. plus shipping, or trade for 1920's Magnavox equipment. R and R Magnavox, 1631 East Broadway, Bismarck, N. Dak. 58501.

RADIOS FOR SALE: Specify your needs or send $1.00 and SASE for list. Refundable. Radio Americana, Box 128, Woodstock, N.Y. 12498.

FOR SALE: Old radios; speakers; tubes; books; magazines; test equipment. Send large SASE and 50¢ in stamps for lists. Krantz, 100 Osage Ave., Somerdale N.J. 08083.

SPECIAL OFFER, WD11 adaptors use UX199-UX120-UT24-864 2 for $7.50 pp. U.S.A. if postmarked before July 4, 1976. K. Parry, 17557 Horace, Granada Hills, CA 91344.

HAVE old car radios, radio tubes, Manuals, AK-33, Midwest #9, 5 band. MacKay, Manning Hill #3, Winchester N.H. 03470. Phone; 603 239-4544.

SET of RIDER MANUALS 1-5 abridged through 14 $125.00 Milford See, Rt. 3, Box 1020-B, Mesquite TX 75149.

WANTED

WANTED any information on "Fleetwood" Radio made by Freshman for export to Canada. Looks same as Freshman-Masterpiece, page 89, Vintage Radio. Darcy Brownrigg, Chelsea, Quebec, JOXINO, Canada.

WANTED: Crystal sets, battery and electric radios and televisions Mfg. before 1935. Need all related items. Will buy one set or complete collection. Young, 11 Willow Court, Totowa, New Jersey 07512.

WANTED: Beginning collector interested in your duplicates, crystal sets, early radios, horn speakers, etc. Any condition. Troe, 111 Skyline Dr. Morristown, New Jersey 07960.

WANTED: All crystal and one tube radios, especially those in boxes with covers. Decent condition, reasonably priced. D. Dazer, 2989 Maywood, Port Huron MI 48060.

WANTED: Power Pack Dial Pointer for Stromberg Carlson model 601-B radio. J. Mason, 90 NW 150th Ave., Beaverton OR 97005.

WANTED

PHONOGRAPHS WANTED - All types (parts) needle tins, boxes, envelopes, counter displays, signs, posters, catalogs, Victor Dogs, etc. Have parts; repair many machines. Jerry Madsen, 8115 Emerson South, Minneapolis, Minn. 55420. Phone; 612 888-9767.

WANTED: Power pack for U. S. Radio and television model case 80 (Riders #1-Pg. 16). Also centre tuning control knob for General Motors Day fan 7 (model 5050). Also Radio News and Radio Craft prior to 1932. Fred Bannister, 1101 Sheffield St., Placentia CA 92670.

WANTED: Radio - all 1920, 1921, Oct. 1922. Many wireless age 1920, 1925, Q.S.T. Feb., March 1920. Radio Craft Aug. 1929, Feb 1931. Thompson, 2930 Delavina, Santa Barbara CA 93105.

WANTED: 1925 RCA Victor Radio, table model. I have RCA 100 speaker. Also wanted any toy phonograph, wind up or early electric. Also Rolmonica or Play-A-Sax, music rolls. Price and condition please. Jack Hanson, 15107 Little Spokane Dr., Spokane, Wash. 99208.

WANTED: Reproducer unit for 1908 or 9 Edison Triumph Phonograph. Top condition only please. Also Edison two minute cylinders, mint condition only, no talkies. Please let me know price & condition first letter. Janet Parsons, P.O. Box 2244, Hobbs, N.M. 88240.

WANTED UNASSEMBLED KIT radio in original box. Boxed parts of any kind. Sets, parts, books, magazines of the 1920s. W6ME, 4178 Chasin St., Oceanside CA 92054.

WANTED: Pre-WWII TV's also need kno knobs for Pilot Candid TV-37 and Gillfillan GN3 Neutrodyne Radio. Cash or trade. David Hammon, 1119 E. First, Long Beach CA 90802.

WANTED: To trade list of magazine and radio as I have duplicates, I like to trade 1920 to 1940 also I buy old radio, parts and magazines. Herman H. Kramer, III, 5413 Rose Ave., Orlando, Florida 32810

WANTED: Any size Victor Dog, any original Victor Dog pictures. Any original Victor, Edison, Columbia posters. Price and condition please. Jack Hanson 15107, Little Spokane Dr., Spokane, Wash. 99208.

WANTED: David Grimes INVERSE DUPLEX Radio model 4DL. This is a reflex battery radio - "Radio News" magazines - 1925 and earlier. J. Albert Warren, Box 279, Church St., Waverly PA 18471.

WANTED: Scott, McMurdo Silver, Lincoln receivers, also paper work on same. J. Cunningham, 23 W. 675 Ardmore, Roselle, Ill. 60172.

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PUETT ELECTRONICS

P.O. BOX 28572 DALLAS TEXAS 75228
PUBLISHERS OF
THE CLASSIC RADIO NEWSLETTER

LIST NO. 14

HOW TO ORDER

(1) Make checks and money orders payable to PUETT ELECTRONICS.

(2) Please state whether new or used tubes are desired and whether a half-price used tube is desired when a new tube is out of stock. REFUNDS are mailed with your invoice for out-of-stock tubes, or when, by customer request, a used tube is substituted for an out-of-stock new tube.

(3) ALL ORDERS ARE SHIPPED PARCEL POST. NO C.O.D. INCLUDE 15% FOR POSTAGE AND HANDLING. INSURANCE RATES ARE 30¢ FOR ORDERS UNDER $50.00. TEXAS RESIDENTS ADD 5% STATE SALES TAX.

MINIMUM ORDER $3.00

CUSTOMER SATISFACTION GUARANTEED - If you are not satisfied with your order for any reason, tubes may be returned within ten days for refund or replacement with exception of tubes which are shorted or have open filaments. It will be assumed that returned tubes with open filaments or shorts were damaged in shipment. Shipping damage claims will be handled promptly through the post office on insured orders. PUETT ELECTRONICS assumes no liability for orders which are not insured, and no liability beyond that which is covered by postal insurance. ALL TUBES ARE THOROUGHLY TESTED ON A MUTUAL CONDUCTANCE TUBE CHECKER BEFORE SHIPMENT.

SCHEMATIC DIAGRAMS

WE CAN FURNISH SCHEMATIC DIAGRAMS AND TECHNICAL DATA ON ALMOST ANY RADIO FROM 1920 TO 1954 FROM OUR LIBRARY OF ORIGINAL MANUFACTURERS SERVICE DATA. Send a self-addressed stamped envelope and $1.50 per radio set. This offer is limited to five photocopied pages. If the data on your set exceeds five pages, we will send you a quote. State mfg. & model number.

THE CLASSIC RADIO NEWSLETTER
E.H. SCOTT & McMURDO SILVER:
Send a self-addressed stamped envelope for a sample.

Send 91¢ in stamps for our new 6 to 8 page classic radio literature list. We sell, buy and trade classic radio literature on Scott & McMurdo Silver.

TYPES 01A, 99, WD-11, etc.
We sometimes have these tubes in stock in very limited quantities. Send a self-addressed stamped envelope for information.

BALLAST TUBES - We can supply many types of ballast tubes or their equivalents. Send a self-addressed stamped envelope with your inquiry.

OLD RADIO TECHNICAL BOOKS - Send SEND FOR OUR COMPLETE CATALOG (see information at foot of page)

TABLE - OLDER TYPE-NUMBER TUBES Prices listed for new tubes. Used tubes are half new tube price.

0A2	$2.	1LB3	$4.	5Y4	$3.	6F6	$3.	6U7	$4.	7Z4	$3.	14B5	$3.	35W4	$2.	81	$6.	5654	$2.
0A3	$2.	1LF3	$4.	5Z3	$3.	6F7	$6.	6V6	$2.	10	$6.	14B6	$3.	35Y4	$3.	82	$3.	5686	$3.
0A4	$2.	1LG5	$4.	5Z4	$3.	6F8	$3.	6V7	$4.	12A5	$4.	14B8	$3.	35Z3	$3.	83	$3.	5691	$3.
0B3	$2.	1LH4	$4.	6A3	$5.	6G5	$4.	6W6	$3.	12A6	$3.	14C5	$3.	35Z4	$3.	83V	$3.	5703	$3.
0C3	$2.	1LN5	$4.	6A4	$6.	6G6	$3.	6X4	$2	12A7	$4.	14C7	$3.	35Z5	$3.	84	$3.	5749	$2.
0D3	$2.	1N5	$4.	6A5	$4.	6H6	$2.	6X5	$2.	12A8	$3.	14E6	$3.	35Z6	$3.	85	$3.	5751	$2.
0Y4	$2.	1N6	$4.	6A6	$4.	6J5	$3.	6Y5	$3.	12AH7	$3.	14E7	$3.	36	$3.	89	$3.	5814	$2.
0Z4	$2.	1P5	$4.	6A7	$5.	6J6	$2.	6Y6	$2.	12AT6	$2.	14F7	$3.	37	$3.	117L7	$4.	5879	$2.
1A1	$5	1Q5	$4.	6A8	$3.	6J7	$3.	6Y7	$2.	12AT7	$2.	14F8	$3.	38	$3.	117M7	$4.	5881	$2.
1A3	$3.	1R5	$2.	6AB4	$3.	6J8	$3.	6Z4	$3.	12AU6	$2.	14H7	$3.	39	$3.	117N7	$7.	5992	$2.
1A4	$3.	1S4	$2.	6AB7	$3.	6K5	$3.	6Z5	$2.	12AU7	$2.	14J7	$3.	40	$6.	117P7	$7.	6080	$3.
1A5	$3.	1S5	$2.	6AC5	$3.	6K6	$3.	6Z7	$2.	12AV6	$2.	14N7	$3.	40Z5	$2.	117Z3	$4.	6146	$4.
1A6	$3.	1T4	$3.	6AC7	$3.	6K7	$3.	6ZY5	$3.	12AX7	$2.	14Q7	$3.	41	$3.	117Z4	$4.	6188	$3.
1A7	$3.	1T5	$3.	6AG7	$3.	6K8	$3.	7A4	$3.	12B7	$2.	14R7	$3.	42	$3.	117Z6	$4.	6842	$2.
1B4	$3.	1U4	$3.	6AK5	$2.	6L5	$4.	7A5	$3.	12B8	$4.	14W7	$3.	43	$3.	485	$4.	6973	$2.
1B5	$3.	1U5	$3.	6AK6	$2.	6L6	$3.	7A6	$3.	12BA6	$2.	14X7	$3.	44	$3.	807	$4.	7025	$2.
1B7	$3.	1V	$4.	6AL5	$3.	6L7	$3.	7A7	$3.	12BE6	$2.	15	$5.	45	$5.	809	$6.	7193	$2.
1B8	$3.	2A3	$6.	6AL7	$4.	6N5	$4.	7A8	$4.	12C5	$3.	19	$4.	45Z3	$2.	837	$4.	9002	$3.
1C1	$4.	2A4	$5.	6AQ5	$2.	6N6	$3.	7AE7	$4.	12C8	$3.	19T8	$2.	45Z5	$2.	843	$3.	9003	$3.
1C5	$3.	2A5	$4.	6AC7	$4.	6N7	$3.	7AF7	$4.	12F5	$3.	22	$5.	46	$6.	879	$2.	9004	$4.
1C6	$3.	2A6	$3.	6AS7	$3.	6P5	$3.	7AG7	$4.	12H6	$3.	24A	$3.	47	$5.	884	$7.	VR-	
1C7	$5.	2A7	$5.	6AT6	$2.	6Q7	$3.	7B4	$3.	12J5	$3.	25A6	$3.	48	$4.	923	$3.	90	$2.
1D5	$5.	2B7	$3.	6AU6	$2.	6R7	$4.	7B5	$3.	12J7	$3.	25A7	$3.	49	$4.	930	$3.	VR-	
1D7	$5.	2C26	$2.	6AV5	$2.	6S4	$4.	7B6	$3.	12K7	$3.	25AC5	$3.	50	$6.	950	$3.	105	$2.
1D8	$4.	2E5	$4.	6AV6	$2.	6S8	$3.	7B7	$3.	12K8	$3.	25B6	$3.	50A5	$3.	951	$3.	VR-	
1D21	$3.	2E30	$2.	6AX5	$2.	6SA7	$2.	7B8	$3.	12L6	$2.	25C6	$2.	50B5	$2.	955	$4.	150	$2.
1E5	$5.	2V3	$4.	6B4	$5.	6SB7	$3.	7C5	$3.	12Q7	$3.	25L6	$3.	50C5	$2.	958	$4.	VT-	
1E7	$4.	2W3	$4.	6B5	$5.	6SC7	$3.	7C6	$3.	12S8	$3.	25S	$3.	50C6	$3.	1005	$3.	52	$4.
1F4	$4.	2X2	$2.	6B6	$5.	6SD7	$3.	7C7	$3.	12SA7	$3.	25Z5	$3.	50L6	$3.	E1148	$2.	XXB	$3.
1F5	$4.	3A4	$3.	6B7	$5.	6SF5	$3.	7E6	$3.	12SC7	$3.	25Z6	$3.	50X6	$3.	1201	$3.	XXFM	$3.
1F6	$4.	3A5	$3.	6B8	$4.	6SF7	$3.	7E7	$3.	12SF5	$3.	26	$4.	50Y7	$3.	1203	$3.	XXL	$3.
1F7	$5.	3A8	$3.	6BA6	$2.	6SG7	$3.	7F7	$4.	12SF7	$3.	26A6	$4.	51	$3.	1232	$3.		
1G4	$4.	3C6	$3.	6BE6	$3.	6SH7	$3.	7F8	$4.	12SQ7	$3.	26A7	$4.	53	$5.	1273	$3.		
1G5	$4.	3LF4	$5.	6BJ6	$2.	6SJ7	$3.	7G7	$3.	12SH7	$3.	27	$3.	55	$4.	1612	$3.		
1G6	$4.	3Q4	$3.	6C4	$2.	6SK7	$3.	7H7	$3.	12SJ7	$3.	28D7	$3.	56	$3.	1620	$3.		
1H4	$5.	3Q5	$3.	6C5	$3.	6SL7	$3.	7J7	$3.	12SK7	$3.	30	$3.	57	$3.	1625	$4.		
1H5	$3.	3S4	$2.	6C6	$3.	6SN7	$2.	7K7	$3.	12SL7	$3.	31	$3.	58	$2.	1626	$3.		
1H6	$3.	3V4	$2.	6C7	$4.	6SQ7	$3.	7L7	$3.	12SN7	$3.	32	$3.	59	$4.	1629	$4.		
1J6	$4.	5AZ4	$4.	6C8	$4.	6SR7	$3.	7N7	$4.	12SQ7	$3.	32L6	$3.	70A7	$3.	1633	$3.		
1L4	$4.	5R4	$2.	6CB6	$2.	6SS7	$3.	7Q7	$3.	12SR7	$3.	32L7	$2.	70L7	$3.	1634	$3.		
1L6	$6	5T4	$2.	6D6	$4.	6ST7	$3.	7R7	$3.	12V6	$3.	33	$3.	71A	$6.	1635	$3.		
1LA4	$4.	5U4	$2.	6D7	$4.	6SU7	$3.	7S7	$3.	12W6	$3.	34	$3.	75	$3.	1656	$3.		
1LA6	$4.	5V4	$2.	6D8	$4.	6SV7	$3.	7V7	$3.	12X4	$2.	35	$3.	76	$3.	1852	$3.		
1LB4	$4.	5V6	$2.	6E5	$4.	6T7	$4.	7W7	$3.	12Z3	$2.	35A5	$4.	77	$3.	1853	$3.		
1LC5	$5.	5W4	$2.	6E6	$4.	6T8	$2.	7X6	$3.	14A4	$3.	35B5	$2.	78	$3.	2050	$3.		
1LC6	$4.	5X4	$3.	6E7	$4.	6U5	$4.	7X7	$3.	14A5	$3.	35C5	$2.	79	$3.	2051	$3.		
1LD5	$4.	5Y3	$3.	6F5	$3.	6U6	$3.	7Y4	$3.	14A7	$3.	35L6	$3.	80	$3.	GK108	$3.		

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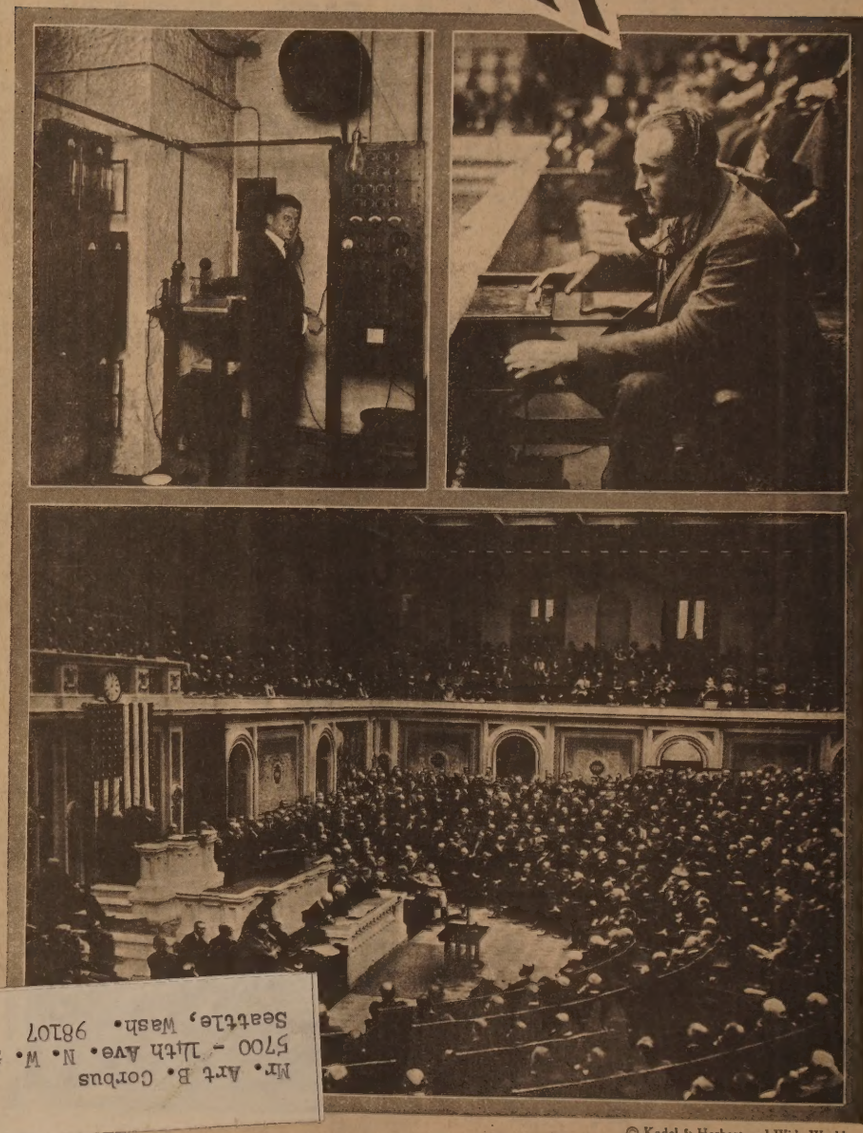

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A PAGE IN RADIO HISTORY

At 12:40 P. M., on Thursday, December 6, 1923, the President's voice as he delivered his annual message to the Congress was heard not only by the Congress, but by all who could listen-in on any one of six stations (WCAP, WEAF, WJAR, WDAF, KSD, and WFAA). People from Maine to Texas heard the speech so clearly that the President's New England inflection was easily noticeable. Two microphones may be seen in front of the President's manuscript. UPPER LEFT: The amplifying panel located in the basement of the Capitol. UPPER RIGHT: The microphone control operator in the balcony of the house

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